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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,445	02/24/2004	Yunzhang Wang	5602	8505

7590 Brenda D. Wentz Legal Department, M-495 PO Box 1926 Spartanburg, SC 29304	03/29/2007
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EXAMINER	
MATZEK, MATTHEW D	

ART UNIT	PAPER NUMBER
1771	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/785,445	Applicant(s) WANG ET AL.	
	Examiner Matthew D. Matzek	Art Unit 1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. The amendment dated 2/26/2007 has been fully considered and entered into the Record.

Claims 1-45 remain active.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-6, 12-18, 22-23, 28, 30, 32, 34-35, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nun et al. (US 2003/0147932) in view of Morgan et al. (US 2003/0096083).

- a. Nun et al. teach a self-cleaning surface for an article that has a "lotus-effect" surface (Abstract). The lotus-effect provides the article with a hydrophobic surface [0003]. The surface of the applied article may comprise polyurethane fibers [0041]. The hydrophobic surface of the applied article, in this case polyurethane fibers, is created from a plurality of irregularities, such as elevations and/or depressions [0029]. To create these elevations particles ranging in diameter from 20nm to 100 microns [0035] may be affixed to the surface of the polyurethane fibers [0043]. The particulate may be silica including fumed silica [0038]. The Examiner takes the position that the applied reference also encompasses colloidal silica. Nun et al. is silent as to the creation of integral surface structures on the surface of the fabric to create the "lotus effect".

- b. Morgan et al. teach a method of creating extremely hydrophobic surfaces that consist of elevations and indentions and that have a hydrophobic layer on their exterior (Abstract). The elevations and indentations may be created via subtractive processes

such as fine blasting, embossing or etching [0027]. The elevations and indentations of the surface are to have a size in the range of 100nm to 200 microns [0026]. The Examiner takes the position that the elevations and indentations are normal to the plane of the surface of the treated substrate as the outward facing surface is treated via process such as fine blasting, embossing or etching which would result in elevations and indentations normal to the surface of the treated substrate. The invention of Morgan et al. is designed to treat the entire outwardly facing surface that would encounter liquid (Abstract). A second step for production of the hydrophobic surface consists of applying a contour-following coating (repellent) that may serve as corrosion protection or a sealing effect [0031]. This coating serves as a separate repellent layer upon which the nanoparticles of Nun et al. would be attached in the combined article.

c. Since Nun et al. and Morgan et al. are from the same field of endeavor (i.e. superhydrophobic articles), the purpose disclosed by Morgan et al. would have been recognized in the pertinent art of Nun et al.

d. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the article of Nun et al. with the surface modification (i.e. elevations and indentations and coating) of Morgan et al. The skilled artisan would have been motivated by the desire to impart the outer surface of the polyester fabric with greater hydrophobicity.

e. Although Morgan et al. do not explicitly teach the claimed feature of a Roughness Factor greater than or equal to about 1.30, it is reasonable to presume that said property is inherent to Morgan et al. Support for said presumption is found in the use of like

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materials (i.e. [polyester fibers with microscopic surface structures]). The burden is upon Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed property of a Roughness Factor greater than or equal to about 1.30 would obviously have been present once the Morgan et al. product is provided. Note *In re Best*, 195 USPQ at 433, footnote (CCPA 1977) as to the providing of this rejection made above under 35 USC 102. Reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner*, et al. (CCPA) 186 USPQ 80.

3. Claims 10-11, 19-21, 24-27, 29, 31, 33, 36, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nun et al. (US 2003/0147932) in view of Morgan et al. (US 2003/0096083) as applied to claims 1, 6, 12, 28, 32, 34, 37, 40, 42, and 44 above, and further in view of Soane et al. (US 6,607,994). The inventions of Nun et al. and Morgan et al. are silent to the use of crosslinked polyurethane as well as nonwoven, woven, knitted substrates or scrims for surface modification.

a. Soane et al. teach a permanent treatment of textiles and other webs that includes the chemical covalent bonding of a payload nanoparticle on the surface of a fiber, yarn, fabric, textile, etc. (Abstract). The term "textile" is directed to encompass woven, nonwoven and knitted substrates (col. 2, lines 45-48). Examiner takes the position that the intent of the Soane et al. is to encompass all textiles, which includes scrims. The "payload" may be attached to the textile via crosslinked urethane polymer (col. 6, lines 25-38).

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b. Since Soane et al. and Nun et al. are from the same field of endeavor (i.e. permanently modified textiles via the attachment of nanoparticles), the purpose disclosed by Soane et al. would have been recognized in the pertinent art of Nun et al.

c. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to have made the article of Nun et al. with textile substrates of Soane et al. and attach the nanoparticles via crosslinked polyurethane. The skilled artisan would have been motivated by the desire use "smart polymers" that react to the environmental surroundings (col. 6, lines 15-28) and create a treated textile for use in a wide variety of applications.

4. Claims 7-9 and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nun et al. (US 2003/0147932) in view of Morgan et al. (US 2003/0096083) as applied to claims 6, above, and further in view of Yamamoto et al. (US 2004/0202818). The inventions of Nun et al. and Morgan et al. are silent to the use fluoroacrylates.

a. Yamamoto et al. teach a method of creating a water and oil-repellent article by treating said article with at least one fluorine-containing compound (Abstract). Fluorine polymers available for application include a fluoroalkyl group-containing (meth)acrylate [0035].

b. Since Nun et al. and Yamamoto et al. are from the same field of endeavor (i.e. hydrophobic articles), the purpose disclosed by Yamamoto et al. would have been recognized in the pertinent art of Nun et al.

- c. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to have coated the article of Nun et al. with a fluoroalkyl group-containing (meth)acrylate motivated by the desire to make the article more hydrophobic.
- d. Claims 40 and 44 are rejected as the fluoropolymer coating serves as a repellent component and the additional layer is provided by the protective coating of Morgan et al.

Response to Arguments

- 5. Applicant's arguments filed 2/26/2007 have been fully considered but they are not persuasive.
- 6. Applicant argues that the combination of the Nun and Morgan inventions would lead to the destruction of the intended function of at least one of the references. In particular, the combination would destroy the function of Nun in that Morgan only teaches the creation of hydrophobic surfaces and Nun teaches that the "anti-microbial particles must not be hydrophobicized". Applicant alleges that such a combination would destroy the intended function taught by Nun of providing surfaces having antimicrobial properties. Therefore, Applicant submits that a *prima facie* case of obviousness has not been established.
- 7. Examiner disagrees with Applicant's continued contention that the combination of the Nun and Morgan teachings would lead to the destruction of the intended function of either of the applied references. The abstract of Nun clearly states that the invention provides for a way to lastingly bind anti-microbial polymers to the self-cleaning (hydrophobic) surface. This means that Nun teaches the creation of a superhydrophobic surface that also possesses anti-microbial properties [0034]. Therefore the process of making a surface hydrophobic as taught by Morgan may be used to make the surface of Nun hydrophobic and then the anti-microbial particles may

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be adhered onto the hydrophobic surface resulting in a surface that had some superhydrophobic areas and anti-microbial areas as well. The invention of Nun is both hydrophobic and hydrophilic (anti-microbial). This concept is the intended invention of Nun.

8. Applicant argues that Nun and Morgan are not from the same field of endeavor, because the surfaces of Nun are self-cleaning and anti-microbial and Morgan is directed to superhydrophobic surfaces. Both of the applied references are from the field of articles with superhydrophobic surfaces.

9. *Conclusion*

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew D. Matzek whose telephone number is (571) 272-2423. The examiner can normally be reached on 8:30 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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